

Abstract Submitted to the  
International Conference on Strongly Correlated Electron Systems  
University of Michigan, Ann Arbor  
August 6-10, 2001

## **SUPERCONDUCTING PARAMETERS OF A CHARGE DENSITY WAVE SUPERCONDUCTOR $\text{Lu}_5\text{Ir}_4\text{Si}_{10}$**

D. Jaiswal<sup>1</sup>, A. Tulapurkar<sup>1</sup>, S. Ramakrishnan<sup>1</sup>, A. K. Grover<sup>1</sup>, B. Becker<sup>2</sup>, R. Hendrikx<sup>2</sup>,  
G. J. Nieuwenhuys<sup>2</sup>, J. A. Mydosh<sup>2</sup>

<sup>1</sup> *Tata Institute of Fundamental Research, Homi Bhabha Road, Mumbai-400 005, India*

<sup>2</sup> *Kamerlingh Onnes Laboratory, University of Leiden, The Netherlands*

Recent studies on single crystals of tetragonal  $\text{Lu}_5\text{Ir}_4\text{Si}_{10}$ <sup>1</sup> have shown an unusual strong-coupling charge density wave transition (CDW) at 83 K. Appearance of X-ray super-lattice peaks below 83 K proves the formation of a periodic lattice deformation which confirms the CDW. We also find that this deformation persists down to 2 K. In this study we establish the occurrence of bulk superconductivity below 3.9 K in a single crystal of  $\text{Lu}_5\text{Ir}_4\text{Si}_{10}$  via resistivity, ac susceptibility, dc magnetization and heat-capacity studies. Thus, both CDW and superconductivity coexist in this system below 3.9 K. The magnetic phase diagram of this superconductor will be constructed based on the temperature dependence of the upper and lower critical fields. In addition, estimates of the London penetration depth, and Ginzburg-Landau coherence length of this anisotropic superconductor will be given.

1. B. Becker *et al* Phys. Rev. B **59**, 7266 (1999)